No. 200700114

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

West Bred, LLC

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR PORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE E PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT ED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Bigg Red'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this ninth day of April, in the year two thousand and seven.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions* — Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER
WestBred, LLC

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME
FA-900-720

3. VARIETY NAME
Bigg Red

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
81 Timberline Dr.
Bozeman, MT 59718-8184

5. TELEPHONE *(include area code)*
406-587-1218

6. FAX *(include area code)*
406-586-8247

FOR OFFICIAL USE ONLY

PVPO NUMBER
#200700114

FILING DATE
Feb. 1, 2007

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
Limited Liability Corporation

8. IF INCORPORATED, GIVE STATE OF INCORPORATION
Arizona

9. DATE OF INCORPORATION
August 4, 2003

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*
Dr. Greg Fox, WestBred, LLC
717 14th Street South
Fargo, ND 58103

FEES RECEIVED

FILING AND EXAMINATION FEES:
$ 4382.00
DATE 2-01-2007

CERTIFICATION FEE:
$ 768.00
DATE 3/01/2007

11. TELEPHONE (Include area code)
701-293-5146

12. FAX (Include area code)

13. E-MAIL
gfox@westbred.com

14. CROP KIND *(Common Name)*
Hard Red Spring Wheat

16. FAMILY NAME *(Botanical)*
Gramineae

15. GENUS AND SPECIES NAME OF CROP
Triticum aestivum

17. IS THE VARIETY A FIRST GENERATION HYBRID?
☐ YES ☒ NO

18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (***OPTIONAL***)
☐ YES ☒ NO
IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERICALIZATION. _____

19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED
(Follow instructions on reverse)

a. ☒ Exhibit A. Origin and Breeding History of the Variety
b. ☒ Exhibit B. Statement of Distinctness
c. ☒ Exhibit C. Objective Description of Variety
d. ☐ Exhibit D. Additional Description of the Variety *(Optional)*
e. ☒ Exhibit E. Statement of the Basis of the Owner's Ownership
f. ☒ Exhibit F. Declaration Regarding Deposit
g. ☒ Voucher Sample *(3,000 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
g. ☒ Filing and Examination Fee ($4,382), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*
☐ YES *(If "yes", answer items 21 and 22 below)* ☒ NO *(If "no", go to item 23)*

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?
☐ YES ☒ NO
IF YES, WHICH CLASSES? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☒ NO
IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED
(If additional explanation is necessary, please use the space indicated on the reverse.)

23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?
☐ YES ☒ NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
☐ YES ☒ NO
IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER		SIGNATURE OF OWNER	
Gregory J. Fox		Dale R. Clark	
NAME *(Please print or type)*		NAME *(Please print or type)*	
Gregory J. Fox		Dale R. Clark	
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
Special Projects Breeder	10-31-06	Director of Research	Jan 29, 2007

(See reverse for instructions and information collection burden statement)

ST-470 (02-06) designed by the Plant Variety Protection Office using Word 2003.

"Bigg Red"
Hard Red Spring Wheat

#200700114

Exhibit A. Origin and Breeding History

Bigg Red (FA-900-720) is a hard red spring wheat derived from the cross "Russ" x "Impervo". Impervo is a scab resistant variety developed from 2375/Sumai-3. The cross was made in the fall of 1998 in a growth chamber and F_1, F_2, F_3 and F_4 seed generations were advanced in growth chambers with selection for agronomic plant (height, stem strength, self-fertility) and seed (hard vitreous) characteristics. An F_4 seed bulk was planted in Fisher, MN in June 1999. Bigg Red was selected as a single scab resistant F_4 plant and planted and evaluated as a 5 ft. x 20 ft. plot in Yuma, AZ in the winter of 1999-2000. It was harvested as a F_5 bulk, planted in the spring of 2000 at 2 sites, Fisher, MN and Casselton, ND, evaluated and advanced as a F_6 bulk and given the experimental designation FA-900-720. FA-900-720 was evaluated for yield and quality in 2001 and advanced as a F_7 bulk. In the winter of 2001-2002 and initial Breeder Seed increase was conducted in Yuma, AZ on 1/10 acre. A second Breeders Seed increase was conducted on 4 acres at Fisher, MN in summer of 2002. FA-900-720 underwent further yield and quality evaluation in 2003. An initial Foundation Seed increase was conducted at Casselton, ND in the summer of 2004 producing about 1100 bushels and FA-900-720 was named Bigg Red. Foundation seed was planted in the spring of 2005 to produce Registered seed and in the spring of 2006 to produce Registered and Certified class seed. The first unencumbered sales of Bigg Red will be in the spring of 2007.

Bigg Red was tested throughout North Dakota, Minnesota, and South Dakota in the Uniform Regional Scab Nursery and the Uniform Regional Nursery (Tables 1-15) in 2001 and 2002. It was tested extensively in company trials from 2001 to 2005 (Tables

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16-18) and North Dakota Agriculture Experiment Station trials in 2005 (Table 19). Bigg Red is a hard red spring wheat bred by WestBred LLC and adapted to North Dakota, Minnesota and South Dakota. Bigg Red is a tall, medium maturity variety with good relative resistance to Fusarium head Blight , i.e. scab (Tables 2, 3, 4, 10). Bigg Red has medium protein levels, high test weight seed, good straw strength, and satisfactory baking quality with average SDS sedimentation values above 100mm (Table 18). Mixographs of Bigg Red (Figure 1) show an acceptable medium dense profile with a well defined peak and tail indicating a suitable, medium strength bred wheat. Bigg Red has red colored spikes.

Bigg Red has been observed for seven generations of increase and testing and is uniform and stable. Bigg Red is a tall variety but can express a tall variants at a frequency of 0.5% in Foundation seed production fields and up to 1.0% may be observed in subsequent generations. Bigg Red may also contain a white colored spike variant at a frequency of about 1/10000 (0.01%). Bigg Red will be purified as head rows on a regular basis.

#200700114

Exhibit B. Statement of Distinctness

Bigg Red is most similar to the hard red spring wheat variety 2375. However, Bigg Red can be distinguished from 2375 by glume color.

1. Bigg Red has reddish brown colored glumes at maturity (Figure 2) that can be described according to the British Colour Council's Horticultural Colour Chart as Spanish Orange $_0$10/$_1$ (page 103). The glumes of 2375 are whitish in color and can be described according to the British Colour Council's Horticultural Colour Chart as Indian Yellow 6/$_3$ (page 6).

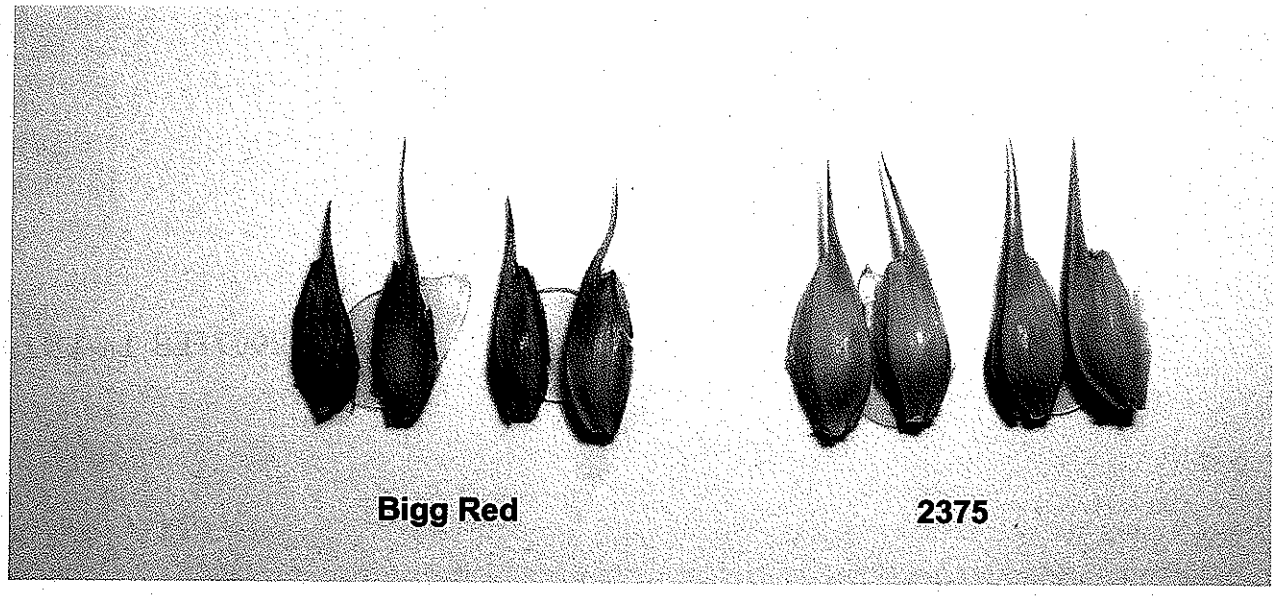

Figure 2. Glumes of Bigg Red and 2375 showing the distinctive colors.

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

Exhibit C

OBJECTIVE DESCRIPTION OF VARIETY
Wheat (*Triticum* spp.)

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
WestBred, LLC	FA-900-720	Bigg Red

ADDRESS *(Street and No. or RD No., City, State, Zip Code and Country)*

81 Timberline Drive
Bozeman, MT 59718-8184

FOR OFFICIAL USE ONLY

PVPO NUMBER

#200700114

PLEASE READ ALL INSTRUCTIONS CAREFULLY:

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g., [0][9][9] or [0][9]) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: Horticultural Colour Chart. Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

[1]
1 = Common
2 = Durum
3 = Club
4 = Other (Specify) _____

2. VERNALIZATION:

[1]
1 = Spring
2 = Winter
3 = Other (Specify) _____

3. COLEOPTILE ANTHOCYANIN:

[1] 1 = Absent 2 = Present

4. JUVENILE PLANT GROWTH:

[2] 1 = Prostrate 2 = Semi-Erect 3 = Erect

5. PLANT COLOR: (boot stage)

[2]
1 = Yellow-Green
2 = Green
3 = Blue-Green

6. FLAG LEAF: (boot stage)

[1] 1 = Erect 2 = Recurved
[2] 1 = Not Twisted 2 = Twisted
[2] 1 = Wax Absent 2 = Wax Present

7. EAR EMERGENCE:

[0][4][8] Number of Days (Average)
[ ][ ] Number of Days Earlier Than * _____
Same As * _____
[0][1] Number of Days Later Than * 2375

**Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial*

8. ANTHER COLOR:

[1] 1 = Yellow 2 = Purple

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9. PLANT HEIGHT: (from soil to top of head, excluding awns)

[0][9][0] cm (Average)

[0][5] cm Taller Than 2375 *

Same As _____ *

[ ][ ] cm Shorter Than _____ *

10. STEM:

A. ANTHOCYANIN

[1] 1 = Absent 2 = Present

B. WAXY BLOOM

[2] 1 = Absent 2 = Present

C. HAIRINESS (last internode of rachis)

[2] 1 = Absent 2 = Present

D. INTERNODE

[1] 1 = Hollow 2 = Semi-Solid 3 = Solid

[4] Number of Nodes

E. PEDUNCLE

[3] 1 = Erect 2 = Recurved 3 = Semi-Erect

[3][6] cm Length

F. AURICLE

[1] Anthocyanin: 1 = Absent 2 = Present

[1] Hair: 1 = Absent 2 = Present

11. HEAD: (At Maturity)

A. DENSITY

[1] 1 = Lax
2 = Middense (Laxidense)
3 = Dense

B. SHAPE

[4] 1 = Tapering
2 = Strap
3 = Clavate
4 = Other (Specify) Oblong

C. CURVATURE

[3] 1 = Erect
2 = Inclined
3 = Recurved

D. AWNEDNESS

[4] 1 = Awnless
2 = Apically Awnletted
3 = Awnletted
4 = Awned

12. GLUMES: (At Maturity)

A. COLOR

[3] 1 = White
2 = Tan
3 = Other (Specify) Red

B. SHOULDER

[2] 1 = Wanting 2 = Oblique
3 = Rounded 4 = Square
5 = Elevated 6 = Apiculate
7 = Other (Specify) _____

C. SHOULDER WIDTH

[2] 1 = Narrow
2 = Medium
3 = Wide

D. BEAK

[3] 1 = Obtuse
2 = Acute
3 = Acuminate

E. BEAK WIDTH

[1] 1 = Narrow
2 = Medium
3 = Wide

F. GLUME LENGTH

[2] 1 = Short (ca. 7 mm)
2 = Medium (ca. 8 mm)
3 = Long (ca. 9 mm)

G. WIDTH

[2] 1 = Narrow (ca. 3 mm)
2 = Medium (ca. 3.5 mm)
3 = Wide (ca. 4 mm)

H. PUBESCENCE

[1] 1 = Not Present
2 = Present

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13. SEED:

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A. SHAPE

[2] 1 = Ovate
2 = Oval
3 = Elliptical

B. CHEEK

[1] 1 = Rounded
2 = Angular

C. BRUSH

[2] 1 = Short
2 = Medium
3 = Long

[1] 1 = Not Collared
2 = Collared

D. CREASE

[1] 1 = Width 60% or less of Kernel
2 = Width 80% or less of Kernel
3 = Width Nearly as Wide as Kernel

[1] 1 = Depth 20% or less of Kernel
2 = Depth 35% or less of Kernel
3 = Depth 50% or less of Kernel

E. COLOR

[3] 1 = White
2 = Amber
3 = Red
4 = Other (Specify) _____

F. TEXTURE

[1] 1 = Hard
2 = Soft
3 = Other (Specify) _____

G. PHENOL REACTION (See Instructions)

[ ] 1 = Ivory
2 = Fawn
3 = Light Brown
4 = Dark Brown
5 = Black

H. SEED WEIGHT

[3][7] g/1000 Seed (whole number only)

I. GERM SIZE

[2] 1 = Small
2 = Midsize
3 = Large

14. DISEASE: PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

(0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

[2] Stem Rust (*Puccinia graminis* f. sp. *tritici*)
[0] Stripe Rust (*Puccinia striiformis*)
[3] Tan Spot (*Pyrenophora tritici-repentis*)
[0] Halo Spot (*Selenophoma donacis*)
[0] *Septoria nodorum* (Glume Blotch)
[0] *Septoria avenae* (Speckled Leaf Disease)
[3] *Septoria tritici* (Speckled Leaf Blotch)
[2] Scab (*Fusarium* spp.)
[0] "Black Point" (Kernel Smudge)
[0] Barley Yellow Dwarf Virus (BYDV)
[0] Soilborne Mosaic Virus (SBMV)
[0] Wheat Yellow (Spindle Streak) Mosaic Virus
[0] Wheat Streak Mosaic Virus (WSMV)
[ ] Other (Specify) _____
[ ] Other (Specify) _____
[ ] Other (Specify) _____

[1] Leaf Rust (*Puccinia recondita* f. sp. *tritici*)
[0] Loose Smut (*Ustilago tritici*)
[0] Flag Smut (*Urocystis agropyri*)
[0] Common Bunt (*Tilletia tritici* or T. *laevis*)
[0] Dwarf Bunt (*Tilletia controversa*)
[0] Karnal Bunt (*Tilletia indica*)
[0] Powdery Mildew (*Erysiphe graminis* f. sp. *tritici*)
[0] "Snow Molds"
[0] Common Root Rot (*Fusarium*, *Cochliobolus* and *Bipolaris* spp.)
[0] Rhizoctonia Root Rot (*Rhizoctonia solani*)
[0] Black Chaff (*Xanthomonas campestris* pv. *translucens*).
[0] Bacterial Leaf Blight (*Pseudomonas syringae* pv. *syringae*)
[ ] Other (Specify) _____
[ ] Other (Specify) _____
[ ] Other (Specify) _____
[ ] Other (Specify) _____

15. INSECT: (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

[0] Hessian Fly (*Mayetiola destructor*)
[0] Stem Sawfly (*Cephus* spp.)
[0] Cereal Leaf Beetle (*Oulema melanopa*)

[ ] Other (Specify) _____
[ ] Other (Specify) _____
[ ] Other (Specify) _____

15. INSECT: (continued) (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

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PLEASE SPECIFY BIOTYPE (Where Needed)

0	Russian Aphid (*Diuraphis noxia*)		Other (Specify) _____
0	Greenbug (*Schizaphis graminum*)		Other (Specify) _____
0	Aphids		Other (Specify) _____

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS:

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Table 1. 2001 Hard Red Spring Wheat Uniform Regional Nursery Summary of Means Across 18 Locations[1].

Line	Yield Bu/Ac	Test Wt. Lb/Bu	Heading d from 6-1	Height cm	Lodging 0-9	Protein %
No. Locations	12	15	13	15	4	6
FA900-720	60.6	62.4	27	86	1.5	14.0
2375	59.2	59.9	26	80	2.6	14.2
VERDE	58.4	58.5	28	78	1.6	14.3
KEENE	57.9	59.0	27	94	2.4	14.4
CHRIS	41.7	56.7	28	99	6.0	15.1
MARQUIS	40.7	56.4	28	100	4.6	14.5
MEAN	56.9	58.9	26	84	2.4	14.5
LSD (0.05)	4.3	1.4	1	3	2.0	0.6
CV	9.5	3.3	4	4	59.5	3.6

[1] Taken from 2001 Uniform Regional Nursery Table 19. Locations are St. Paul, Morris, and Crookston, MN; Langdon, Williston, Minot, Carrington, Prosper and Hettinger, ND; Brookings, Selby and Groton, SD; Sidney, NE; Bozeman, MT; Powell, WY; Pullman, WA; Swift Current, SK and Glenlea, MB, Canada.

Table 2. 2001 Hard Red Spring Wheat URN Fusarium Head Blight Reactions, St. Paul, MN.[1]

Line	Heading days from 6-1	Incidence %	Severity %	Disease %	Yield g/plot	Test Wt. Lb/Bu	VSK[2] %
MARQUIS	27	85	67.6	57.4	191	57.2	10.5
CHRIS	27	92.5	60.9	56.4	154	54.4	16
2375	25	97.5	50.2	48.8	167	55.8	10
VERDE	27	100	75.7	75.7	154	52.2	22.5
KEENE	25	97.5	64.4	63	109	56.4	10
FA900-720	27	55	22.8	12.6	272	61.5	2
ALSEN (R CK)	26	100	55.2	55.2	136	57	15.5
MCVEY (R CK)	29	90	58.2	52.2	170	52.2	18.5
ROBLIN (S CK)	23	92.5	66.2	61.2	140	53	16.5
WHEATON (S CK)	28	100	91.3	91.3	96	43.7	50
MN00269 (S (CK)	29	97.5	86.2	83.9	90	44.8	42.5
MEAN	25	95.9	62.6	60.8	141	53.1	18.2
LSD (0.05)	1	13.2	21.7	23.8	84.6		13.7
CV	2.1	6.8	17.2	19.3	29.5		37.2

[1] Taken from 2001 Uniform Regional Nursery Table 21.
[2] VSK = visually scabby kernels.

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Table 3. 2001 Hard Red Spring Wheat URN Fusarium Head Blight Reactions Crookston, MN.[1]

Line	Heading days from 6-1	Incidence %	Severity %	Disease %	Yield g/plot	Test Wt. Lb/Bu	VSK[2] %
MARQUIS	30	52.5	9.8	5.2	122	47.1	45
CHRIS	30	42.5	20.9	9.4	138	49.1	45
2375	28	90	27.1	24.4	194	51.3	32.5
FA900-720	28	37.5	9.5	3.5	341	60.1	6
BACUP (R CK)	25	25	7.3	1.8	184	56.4	7
ALSEN (R CK)	28	85	14.5	12.3	220	56.1	16
MCVEY (R CK)	32	67.5	12.5	8.3	248	49.6	16
ROBLIN (S CK)	27	92.5	23	21.5	214	50.2	50
WHEATON (S CK)	30	100	44.7	44.7	129	40.3	50
MN00269 (S CK)	33	97.5	44.4	43.1	107	38.6	50
MEAN	28	79.3	20.8	18.1	206	51	29.2
LSD	1.1	20.5	11.5	12	52		13.9
CV	1.9	12.8	27.3	32.9	12.5		23.4

[1] Taken from 2001 Uniform Regional Nursery Table 22.
[2] VSK = visually scabby kernels.

Table 4. Adult leaf rust reactions in the 2001 HRSWURN [USDA-ARS, NDSU, (Miller, Rasmussen)].[1]

Line	Percent Severity and Reaction			
	Fargo	Carrington	Langdon	C.I.[2]
MARQUIS	10MS-tS	10S-5MS	20S	14.2
CHRIS	10MS	5R	10R	3.7
2375	10R	tMS	10R	1.5
VERDE	tMS	5R	5R	0.8
KEENE	10R	0	10R	1.3
FA900-720	20MS	10S-5MS	20S-10MS	19.3
Baart (CK)	**	10S	11S	
Thatcher (CK)	10S	10S	40s	

[1] Taken from 2001 Uniform Regional Nursery Table 23. Leaf rust was light this year at the time of data collection. Carrington was read approximately 1 week (7/20/01) too early. Langdon (8/3/01) and Fargo (7/24/01) were read at appropriate times, but heavy stem rust infections made it difficult to evaluate leaf rust in Fargo. Date of Planting - Fargo; 5/17/01, Carrington; 4/30/01, Langdon; 5/15/01.

[2] C.I. = Average Coefficient of Infection. Percent severity multiplied by the following values for reaction type. R = 0.2, MR = 0.4, MS = 0.8, S = 1.0, t = 0.5. Multiplication was carried out for each station and then the average was determined across stations.

** = Line/cultivar not evaluated for leaf rust in Fargo because of heavy stem rust infection.

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Table 5. Adult stem rust reactions in the 2001 HRSWURN [USDA-ARS, NDSU (Miller, Rasmussen)].[1]

Line	Percent Severity and Reaction[2]		
	Fargo	Carrington	Langdon
MARQUIS	40MSS	0-10MRMS	0-tS
CHRIS	5-20SMS	0	0
2375	5-20RMR	0	0
VERDE	5-20MSS	0	0
KEENE	tR	0	0
FA900-720	40-50MRR	0	0
FA900-793	5-20R	0	0
Baart (CK)	60S	40S	4S

[1] Taken from 2001 Uniform Regional Nursery Table 24. Reading - made at dough stage. Date of Planting - Fargo; 5/17/01, Carrington; 4/30/01, Langdon; 5/15/01. Comma - separation of plants into two or more reaction classes (segregation or seed mixture). Dash - range in severity between plants with the same reaction.

[2]Natural inoculum - plus additional inoculum of pathotypes: Pgt - TMLK, - TPMK, - RTQQ, - QFCQ and - QTHJ at Fargo.

Table 6. 2001 Uniform Regional Scab Nursery for Spring Wheat Parents Combined Over Seven Locations.

Entry no.	Entry name	Incidence %	Severity %	Disease %	VSK[2] %	DON[3] ppm
No. locations		6	6	6	5	4
1	2375	85.4	31.4	28.3	31.9	9.0
2	WHEATON	87.7	52.1	49.5	50.1	22.6
3	BACUP	78.7	27.2	23.2	22.4	5.0
4	OSLO	89.1	50.0	48.9	39.7	15.5
27	FA-900-720	78.1	25.9	22.8	19.1	3.3
	MEAN	81.1	35.4	32.6	28.4	8.1
	LSD (.05)	16.4	14.3	15.4	10.8	5.5

[1] Taken from 2001 Uniform Regional Scab Nursery Table 9. Locations are Ames,Iowa, Brookings, South Dakota, St. Paul and Crookston, MN, Prosper and Langdon, ND, and Glenlea, Manitoba,Canada.

[2] VSK = visually scabby kernels.
[3] Don = Deoxynivalenol

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Table 7. 2002 Hard Red Spring Wheat Uniform Regional Nursery Summary of Means Across 18 Locations.

Line	Yield Bu/Ac	Test Wt. Lb/Bu	Heading days from 6-1	Height cm	Lodging 0-9	Protein %
No. Locations	16	17	15	17	8	9
Verde	40.2	58.2	31	68	0.5	15.5
SD3533	40.1	59	27	74	0.9	15.4
Keene	39.9	58.3	31	79	0.4	15.9
01M88	39.5	57.7	32	61	0.5	14.5
2375	39.1	58.6	30	70	2.2	15.4
FA-900-720	37.8	59.8	31	73	0.9	14.9
Chris	30.7	56	32	83	2.5	16.2
Marquis	27.7	56.2	33	86	2.5	15.6
Mean	39.8	58.1	29	71	1	15.7
LSD (0.05)	3.8	0.9	1	2	0.7	0.3

[1] Taken from 2002 Uniform Regional Nursery Table 21. Locations are St. Paul, Morris, and Crookston, MN; Langdon, Williston, Minot, Carrington, Prosper and Hettinger, ND; Brookings, Selby and Groton, SD; Sidney, NE; Bozeman, MT; Powell, WY; Pullman, WA; Swift Current, SK and Glenlea, MB, Canada.

Table 8. Hard Red Spring Wheat Uniform Regional Nursery 2-Year Means Summary, 2001-2002.[1]

Line	Yield Bu/Ac	Test Wt. Lb/Bu	Heading days from 6-1	Height cm	Lodging 0-9	Protein %
No. Locations	28	32	28	32	12	15
Verde	47.9	58.3	30	72	0.8	15
2375	47.7	59.2	28	75	2.3	14.9
Keene	47.6	58.6	29	86	1.1	15.3
FA-900-720	47.6	61	29	79	1.1	14.5
Chris	35.4	56.3	30	90	3.7	15.8
Marquis	33.3	56.3	31	92	3.2	15.2
Mean	45.7	58.3	29	78	1.7	15.1
LSD (0.05)	3	0.8	1	2	1	0.3

[1] Taken from 2002 Uniform Regional Nursery Table 22.

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Table 9. 2002 Hard Red Spring Wheat URN *Fusarium* Head Blight Reactions, Crookston, MN.[1]

Line	Heading days from 6-1	Incidence %	Severity %	Disease %	Wt. of 30 heads grams	VSK[2] %	DON[3] ppm
Marquis	35	52.5	16.7	12.8	17.0	4.0	2.0
Chris	36	65.0	23.9	17.6	15.5	10.5	4.0
2375	34	82.5	20.6	17.0	19.8	9.0	4.5
Verde	36	75.0	21.3	16.8	15.0	12.5	6.0
Keene	35	67.5	27.2	20.3	19.3	6.0	5.9
FA-900-720	35	55.0	10.8	6.3	21.0	3.0	1.9
BACUP (R CK)	32	50.0	14.9	9.2	16.0	4.0	1.8
ALSEN (R CK)	33	62.5	15.9	9.2	16.0	4.0	3.1
MCVEY (R CK)	38	65.0	13.7	8.8	23.5	6.0	3.7
ROBLIN (S CK)	32	92.5	51.4	49.5	16.0	10.5	5.2
WHEATON (S CK)	35	100.0	57.9	57.9	22.0	27.5	10.1
Mean	34	78.8	28.9	25.4	17.9	9.0	5.0
LSD (0.05)	1	34.5	23.4	26.1	NS	7.1	

[1] Taken from 2002 Uniform Regional Nursery Table 23. [2] VSK = visually scabby kernels.
[3] Don = Deoxynivalenol

Table 10. 2002 Hard Red Spring Wheat URN *Fusarium* Head Blight Reactions, St. Paul, MN.[1]

Line	Heading days from 6-1	Incidence %	Severity %	Disease %	Wt. of 30 heads grams	VSK[2] %	DON[3] ppm
Marquis	26	100.0	63.4	63.4	5.8	25.0	11.9
Chris	28	100.0	72.2	72.2	8.1	40.0	9.7
2375	26	100.0	44.5	44.5	15.5	17.5	4.0
Verde	19	95.0	49.4	47.3	8.6	35.0	8.9
Keene	26	75.0	19.9	14.8	11.9	27.5	10.8
FA-900-720	27	72.5	18.5	13.8	18.8	7.0	2.0
HY469	24	100.0	84.2	84.2	9.3	27.5	18.9
BACUP (R CK)	22	80.0	33.3	28.1	12.5	18.5	4.1
ALSEN (R CK)	25	80.0	24.0	19.4	11.2	15.0	5.0
MCVEY (R CK)	30	87.5	28.8	25.1	11.9	32.5	8.8
ROBLIN (S CK)	22	100.0	77.0	77.0	7.9	75.0	8.4
WHEATON (S CK)	28	100.0	81.7	81.7	7.6	85.0	8.9
Mean	25	91.9	47.4	45.0	10.4	31.7	7.5
LSD (0.05)	5	19.1	21.6	23.2	4.1	21.6	

[1] Taken from 2002 Uniform Regional Nursery Table 24. [2] VSK = visually scabby kernels.
[3] Don = Deoxynivalenol

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Table 11. 2002 Hard Red Spring Wheat URN Adult Leaf and Stem Rust Reactions, St. Paul, MN.[1]

Line	Heading days from 6-1	Leaf Rust	Stem Rust
Marquis	31	50S	60S
Chris	33	10-20M	10MR-MS
2375	33	40M	20R-MR
Verde	35	40M	30MS-S
Keene	32	tR, 50MS	30MR-R
FA-900-720	35	40M	10MR

[1] Taken from 2002 Uniform Regional Nursery Table 26.

Table 12. Adult Leaf Rust Reactions in the 2002 HRSWURN [USDA-ARS, NDSU, (Miller, Rasmussen)].[1]

	Percent Severity and Reaction			
Line	Fargo	Carrington	Langdon	C.I.*
Marquis	30S	50S	50S	43.3
Chris	10S-10MS-tMR	60S	30S	36.1
2375	20S	60S	50S	43.3
Verde	10R	20MR-tMS	5R	3.8
FA-900-720	40S	60S	50S	50.0
Baart (CK)	50S	50S	60S	53.3

[1] Taken from 2002 Uniform Regional Nursery Table 27.

Date of Planting - Fargo; 5/20/02, Carrington; 5/2/02, Langdon; 4/30/02.

*C.I. = Average Coefficient of Infection. Percent severity multiplied by the following values for reaction types: R=0.2, MR=0.4, MS=0.8, S=1.0, t=0.5. Multiplication carried out for each reporting station and then an average is taken across stations.

Table 13. Stem Rust Seedling Reactions in the 2002 HRSWURN [USDA-ARS, NDSU (Miller)].[1]

	Stem rust pathotypes and seedling reactions						
Line	Pgt-HPHJ	Pgt-MCCF	Pgt-RHTS	Pgt-RTQQ	Pgt-QCCJ	Pgt-QTHJ	Pgt-TPMK
Marquis	MS	S	MS	MR	MS	MR	MS
Chris	VR	R	VR	MS	VR	MS	S
2375	R	R	MR	MS	VR	MS	R
Verde	VR	VR	VR	R	VR	MS	MR
Keene	R	R	R	R	VR	R	R
FA-900-720	MR	--	MR	MR	R	MR	MR

[1] Taken from 2002 Uniform Regional Nursery Table 28.

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Table 14. Adult Stem Rust Reactions in the 2002 HRSWURN [USDA-ARS, NDSU (Miller, Rasmussen)].[1]

	Percent Severity and Reaction*		
Line	**Fargo**	**Carrington**	**Langdon**
Marquis	40MSS	t-5S	25MSS
Chris	0,t-10S	0	0
2375	0-tMR	0	0
Verde	t-5MS	0	0
Keene	tR	0	0
FA-900-720	tR	0	0
Baart (CK)	40S	t-20S	10-25S

[1] Taken from 2002 Uniform Regional Nursery Table 29. Date of Planting - Fargo; 5/20/02, Carrington; 5/2/02, Langdon; 4/30/02. Reading - made at dough stage.

*Natural inoculum - plus additional inoculum of pathotypes: Pgt - TMLK, - TPMK, - RTQQ, - QFCQ. and - QTHJ at Fargo. Comma - separation of plants into two or more reaction classes (segregation or seed mixture). Dash - range in severity between plants with the same reaction.

Table 15. 2002 URSN for Spring Wheat Parents Summary of Means Across Six Locations.[1]

Line	Incidence	Severity	Disease	VSK[2]	DON[3]	Incidence	Severity	Disease	VSK	DON
	%	%	%	%	ppm	Rank	Rank	Rank	Rank	Rank
No. Locations	6	6	5	5	4	6	6	5	5	4
2375	87	47	36.3	30.6	15.6	35	35	34	33	32
Wheaton	94.4	63.4	55.7	52.7	20.5	43	43	43	44	41
BacUp	73.9	28	18.6	18.8	9.7	18	9	10	15	7
Oslo	93.6	66.1	57.9	48.9	22.2	42	44	44	43	44
FA-900-720	64.8	22	11.8	17.2	8.1	7	3	3	9	3
Mean	76.7	38.6	27.5	24.7	13.8					
LSD (0.05)	15.2	11.5	13.5	10.6	5.5					

[1] Taken from 2002 Uniform Regional Scab Nursery for Spring Wheat Parents Table 8. Locations were Brookings, SD; St. Paul and Crookston, MN; Prosper and Langdon, ND; and Glenlea, MB, Canada.
[2] VSK = visually scabby kernels.
[3] Don = Deoxynivalenol

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Table 16. Performance of Selected Cultivars and Bigg Red from 2002 to 2005 in WestBred LLC Sponsored Trials.

Variety	No. Reps.	Yield -bu/a-	Test Weight -lb/bu-	Heading Date[1]	Height -cm-	Protein -%-	Sed[2] -mm-	VSK[3] -%-	Leaf Rust (1-7)[4]	Kernel Weight[5] -g-
2005 Crookston, MN										
Bigg Red	3	66.5	63.9	-	-	15.6	101	0.3	-	-
Knudson	3	63.4	60.3	-	-	15.0	115	3.0	-	-
2375	3	61.2	60.8	-	-	15.7	99	3.0	-	-
Briggs	3	56.3	60.9	-	-	14.4	94	2.3	-	-
Alsen	3	53.4	62.7	-	-	15.9	109	0.7	-	-
2005 Crystal, ND										
2375	2	75.2	60.9	-	-	15.6	98	1.0	-	-
Knudson	2	68.5	59.7	-	-	15.0	117	0.7	-	-
Bigg Red	2	65.8	62.4	-	-	15.1	99	0.7	-	-
Alsen	2	53.3	59.8	-	-	16.9	114	1.0	-	-
Briggs	2	49.6	59.3	-	-	16.0	96	2.7	-	-
2005 Reynolds, ND										
Bigg Red	3	65.9	60.6	30.0	-	15.2	105	0.3	-	-
2375	3	62.4	58.6	29.0	-	15.2	112	4.0	-	-
Knudson	3	62.4	57.5	30.0	-	15.3	121	7.7	-	-
Alsen	3	54.7	59.7	29.0	-	15.6	117	1.7	-	-
Briggs	3	50.2	57.2	28.0	-	14.3	110	6.7	-	-
2005 Fisher, MN - Fungicide										
Knudson	3	60.8	59.5	27.7	-	15.0	115	1.3	-	-
Bigg Red	3	59.4	62.4	28.0	-	15.2	105	1.0	-	-
2375	3	56.0	58.8	26.0	-	15.7	113	1.3	-	-
Alsen	3	50.6	60.8	25.7	-	16.7	115	0.3	-	-
Briggs	3	48.8	59.5	24.7	-	16.3	112	0.7	-	-
2005 Fisher, MN - No Fungicide										
Knudson	3	49.0	60.4	27.0	-	15.1	121	2.3	2	-
Alsen	3	42.4	61.6	25.0	-	16.3	119	1.0	4	-
2375	3	38.5	57.9	25.0	-	14.9	111	2.0	5	-
Briggs	3	37.4	59.6	23.0	-	15.8	115	1.7	3	-
Bigg Red	3	36.2	60.2	28.0	-	13.7	113	0.0	6	-
2005 Steele, ND - No Fungicide										
Knudson	4	52.7	58.1	31.0	81.3	15.1	116	3.0	2	-
Briggs	4	47.4	58.2	25.0	84.5	16.7	96	4.0	2	-
Alsen	4	43.1	59.6	27.0	81.3	15.2	113	1.7	3	-
Bigg Red	4	41.2	60.0	29.5	91.4	14.7	96	1.7	5	-
2005 Steele, ND - Fungicide										
Bigg Red	4	56.8	61.8	30.0	91.4	14.7	96	0.7	-	-
Knudson	4	55.4	59.0	29.5	81.3	15.4	118	1.7	-	-
Briggs	4	52.0	58.7	26.5	84.5	15.7	104	3.7	-	-
Alsen	4	51.8	60.3	28.0	81.3	15.8	108	1.7	-	-

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Table 16. Continued.

Variety	No. Reps.	Yield -bu/a-	Test Weight -lb/bu-	Heading Date[1]	Height -cm-	Protein -%-	Sed[2] -mm-	VSK[3] -%-	Leaf Rust (1-7)[4]	Kernel Weight[5] -g-
2005 Felton, MN - Fungicide										
Bigg Red	4	67.8	60.9	29.5	81.3	14.3	111	0.0	-	-
Knudson	4	67.5	59.2	29.0	74.9	13.9	120	2.3	-	-
Briggs	4	61.4	58.5	26.5	73.7	15.3	114	1.7	-	-
Alsen	4	59.5	60.1	28.0	81.3	15.2	118	1.3	-	-
2005 Felton, MN - No Fungicide										
Bigg Red	4	70.3	61.6	30.5	82.6	13.8	113	0.3	-	-
Knudson	4	69.4	60.0	28.5	71.1	13.7	115	3.7	-	-
Briggs	4	64.2	59.8	26.5	76.2	14.9	109	2.0	-	-
Alsen	4	60.8	60.4	28.5	80.0	14.9	117	1.3	-	-
2005 Belfield, ND										
Knudson	4	77.0	61.8	27.8	71.8	13.6	118	-	-	-
Alsen	4	67.1	62.8	26.3	87.6	14.6	113	-	-	-
Bigg Red	4	63.0	63.0	28.0	84.5	13.0	88	-	-	-
2005 Casselton, ND										
Knudson	3	63.4	59.5	28.3	84.7	13.9	120	3.3	1	-
Briggs	3	63.3	60.4	26.0	90.6	14.7	105	2.7	3	-
Alsen	3	61.0	61.6	26.7	89.7	15.1	116	1.0	4	-
Bigg Red	3	53.2	61.4	28.3	95.7	13.0	94	0.3	6	-
2005 Bristol, SD										
Bigg Red	4	74.1	61.3	19.3	-	14.0	97	1.7	6.0	-
Briggs	4	67.5	59.6	17.3	-	15.2	111	5.0	3.5	-
Alsen	4	61.6	60.6	19.8	-	15.6	119	5.0	6.0	-
2005 Valley City, ND										
Knudson	4	45.0	58.5	28.8	71.1	15.1	116	4.0	1	-
Alsen	4	40.4	59.8	27.5	74.9	15.3	113	1.7	2	-
Bigg Red	4	33.1	59.4	28.0	80.6	13.4	98	0.7	5	-
2004 Belfield, ND										
Bigg Red	3	46.4	62.2	25.0	73.7	14.1	105	-	-	-
Alsen	3	45.1	61.1	23.7	71.1	14.2	-	-	-	-
2375	3	42.6	60.9	24.0	67.7	13.8	-	-	-	-
Knudson	3	42.0	61.2	24.7	66.0	14.7	-	-	-	-
Briggs	3	37.5	61.8	21.3	68.6	15.1	114	-	-	-
2004 Casselton, ND										
2375	3	89.2	62.8	24.0	99.1	14.0		0.0	-	41.0
Bigg Red	3	85.3	63.7	24.0	98.2	13.2	105	0.0	-	36.3
Alsen	3	82.4	63.9	23.0	100.8	14.6		0.0	-	36.0
Knudson	3	80.8	63.0	26.7	89.7	13.5		1.1	-	36.6
Briggs	3	74.2	62.2	21.0	96.5	13.9		0.0	-	34.6

Table 16. Continued.

Variety	No. Reps.	Yield -bu/a-	Test Weight -lb/bu-	Heading Date[1]	Height -cm-	Protein -%-	Sed[2] -mm-	VSK[3] -%-	Leaf Rust (1-7)[4]	Kernel Weight[5] -g-
2004 Fisher, MN										
Knudson	3	76.0	60.9	-	83.0	12.6	117	1.8	-	37.7
Alsen	3	64.6	62.5	-	88.9	13.3	117	2.2	-	39.3
Bigg Red	3	64.1	62.3	-	99.9	12.2	103	0.6	-	38.7
2375	3	63.4	61.0	-	87.2	12.7	111	2.4	-	43.3
Briggs	3	58.6	61.5	-	89.7	13.0	111	2.3	-	38.3
2004 Eldrid, MN										
Knudson	3	43.6	60.9	41.3	80.4	11.1	117	2.5	-	-
2375	3	42.3	62.3	40.0	85.5	11.1	86	2.1	-	-
Bigg Red	3	39.4	63.2	45.0	86.4	10.3	75	0.0	-	-
Alsen	3	37.6	62.7	41.7	83.8	11.8	106	0.7	-	-
Briggs	3	33.7	61.5	38.3	88.1	10.5	70	0.8	-	-
2004 Thompson, ND										
2375	3	73.9	62.9	41.3	99.9	14.6	115	2.4	-	-
Bigg Red	3	64.1	63.4	43.7	97.4	14.3	112	0.0	-	-
Knudson	3	63.6	61.5	40.3	88.1	13.9	122	2.5	-	-
Briggs	3	58.4	62.5	37.3	94.8	15.0	110	2.5	-	-
Alsen	3	55.9	62.4	40.7	93.1	15.1	119	1.0	-	-
2004 West Fargo, ND – Fungicide										
2375	4	73.9	62.8	28.3	86.4	15.1	-	0.6	3.0	-
Alsen	4	70.3	63.9	28.0	93.3	15.8	-	0.4	1.8	-
Bigg Red	4	66.0	63.7	28.3	98.4	15.0	106	0.0	2.3	-
Knudson	4	65.7	61.4	29.5	84.5	14.7	-	3.1	1.0	-
Briggs	4	58.4	62.6	26.3	87.0	15.6	-	0.5	1.3	-
2004 West Fargo, ND – No Fungicide										
Alsen	4	69.8	62.8	27.8	93.3	14.9	-	0.0	3.5	-
Knudson	4	69.1	61.6	29.8	86.4	13.8	-	0.6	1.5	-
Briggs	4	66.9	62.2	26.3	86.4	15.4	-	0.0	2.0	-
2375	4	65.8	61.3	28.3	86.4	14.6	-	1.2	4.0	-
Bigg Red	4	61.5	63.0	27.8	94.0	13.4	99	0.0	4.0	-
2004 Steele, ND – No Fungicide – Hail										
Briggs	4	41.6	59.6	30.3	88.9	12.7	-	2.0	-	-
Knudson	4	39.0	59.6	33.8	81.3	12.2	-	0.8	-	-
2375	4	32.6	58.5	32.8	91.4	13.1	-	1.4	-	-
Alsen	4	26.6	59.7	32.3	86.4	13.0	-	1.0	-	-
Bigg Red	4	25.4	60.8	33.0	99.1	11.3	-	0.9	-	-
2004 Steele, ND – Fungicide – Hail										
Briggs	4	48.6	60.4	31.0	88.9	15.0	-	0.0	-	-
Knudson	4	43.1	60.3	35.3	81.3	13.9	-	2.3	-	-
2375	4	38.9	60.1	33.8	91.4	14.7	-	2.0	-	-
Alsen	4	35.7	61.3	32.5	83.8	15.5	-	-	-	-
Bigg Red	4	31.6	63.0	33.0	96.5	14.3	-	0.0	-	-

Table 16. Continued.

Variety	No. Reps.	Yield -bu/a-	Test Weight -lb/bu-	Heading Date[1]	Height -cm-	Protein -%-	Sed[2] -mm-	VSK[3] -%-	Leaf Rust (1-7)[4]	Kernel Weight[5] -g-
2003 Fisher, MN										
Bigg Red	3	66.0	64.2	28.0	92.2	14.6	112	-	-	-
Knudson	3	65.6	62.0	26.0	82.0	14.3	-	-	-	-
Briggs	3	63.7	62.1	22.3	83.1	15.1	-	-	-	-
Alsen	3	62.2	62.6	24.3	88.1	15.6	120	-	-	-
2003 Crookston, MN										
Knudson	3	65.9	62.5	26.0	86.4	13.7	-	-	-	-
Bigg Red	3	56.2	63.8	28.0	88.9	13.8	108	-	-	-
Alsen	3	50.1	63.5	25.0	88.1	15.0	118	-	-	-
Briggs	3	45.2	61.7	24.0	84.6	14.4	-	-	-	-
2003 Reynolds, ND										
Knudson	3	82.4	61.2	28.0	85.6	13.8	-	-	-	-
Alsen	3	69.5	63.0	27.0	82.0	14.8	117	-	-	-
Briggs	3	67.9	62.5	23.0	81.3	14.6	-	-	-	-
Bigg Red	3	62.4	64.2	28.0	88.9	13.4	105	-	-	-
2003 Casselton, ND - Fungicide										
Bigg Red	4	72.8	63.4	-	-	15.4	-	-	-	-
Knudson	4	70.2	62.0	-	-	15.5	-	-	-	-
Alsen	4	65.7	62.7	-	-	16.7	116	-	-	-
Briggs	4	65.1	61.7	-	-	16.3	-	-	-	-
2003 Casselton, ND - No Fungicide										
Knudson	4	66.5	62.0	-	-	15.3	-	-	-	-
Bigg Red	4	64.4	62.5	-	-	14.8	-	-	-	-
Briggs	4	64.0	61.4	-	-	16.3	-	-	-	-
Alsen	4	60.4	62.0	-	-	16.5	119	-	-	-
2003 Borup, MN - Fungicide										
Bigg Red	4	88.1	64.0	-	-	14.1	-	-	-	-
Knudson	4	78.6	62.0	-	-	14.0	-	-	-	-
Briggs	4	74.2	61.8	-	-	14.6	-	-	-	-
Alsen	4	73.9	62.9	-	-	14.8	119	-	-	-
2003 Borup, MN - No Fungicide										
Bigg Red	4	74.9	63.7	-	-	14.1	-	-	-	-
Knudson	4	72.4	61.8	-	-	13.8	-	-	-	-
Alsen	4	71.4	62.9	-	-	15.4	120	-	-	-
Briggs	4	68.1	62.2	-	-	15.6	-	-	-	-
2003 Fisher, MN - Fungicide										
Bigg Red	3	68.6	65.2	-	-	14.9	-	-	-	-
Knudson	1	59.3	62.1	-	-	14.5	-	-	-	-
Briggs	3	56.7	62.7	-	-	15.2	-	-	-	-
Alsen	2	49.9	63.2	-	-	15.6	123	-	-	-

Table 16. Continued.

Variety	No. Reps.	Yield -bu/a-	Test Weight -lb/bu-	Heading Date[1]	Height -cm-	Protein -%-	Sed[2] -mm-	VSK[3] -%-	Leaf Rust (1-7)[4]	Kernel Weight[5] -g-
2003 Fisher, MN - No Fungicide										
Bigg Red	3	70.5	64.8	-	-	14.3	-	-	-	-
Knudson	1	60.7	63.2	-	-	13.6	-	-	-	-
Briggs	3	56.1	62.6	-	-	15.1	-	-	-	-
Alsen	2	52.2	63.8	-	-	15.1	119	-	-	-
2002 Casselton, ND										
Knudson	3	35.3	60.1	-	-	15.2	120	-	-	-
Alsen	3	29.8	60.0	-	-	16.0	121	-	-	-
Bigg Red	3	28.2	59.0	-	-	14.3	107	-	-	-
2375	3	27.1	57.6	-	-	14.2	115	-	-	-
2002 Dakota Growers Pasta Trials - 6 ND locations[6]										
Alsen	24	45.3	60.8	-	-	16.3	121.5	-	-	-
Bigg Red	24	42.8	60.6	-	-	14.1	106.8	-	-	-

[1] Heading Date = Days after June 1.
[2] Sed= Flour SDS sedimentation value, a measure of gluten strength.
[3] VSK = visually scabby kernels.
[4] Leaf Rust = scale of 1 (resistant) to 7 (very susceptible).
[5] Kernel Weight = gram weight of 1000 seed.
[6] See Table 18 for locations.

Table 17. Foliar disease ratings in 2002 Dakota Growers Pasta trials in six locations in ND.

Variety	% Leaf Spot					
	Garrison	Ross	Leeds	Carrington	West Hope	Rolla
Bigg Red	35.0	8.0	75.0	43.0	50.0	17.0
Alsen – Moderately Resistant check	10.0	2.5	17.5	40.0	43.3	3.0
Ingot – Susceptible check	55.0	15.0	90.0	95.0	87.0	47.0

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Table 18. Summary of Data from WestBred LLC Trials from 2002 to 2005. #20070014

Variety	Yield No. Reps.	Yield -bu/a-	Test Weight -lb/bu-	Heading Date[1]	Height -cm-	Protein -%-	Sed[2] -mm-	VSK[3] -%-	Leaf Rust (1-7)[4]	Kernel Weight[5] -g-
Overall - 15 to 33 locations										
2375	15	56.3	60.5	30.2	88.3	14.3	106.2	1.8	4.0	42.1
Alsen	33	53.3	61.7	28.1	85.7	15.3	117.0	1.2	3.5	37.6
Bigg Red	33	56.9	62.3	29.7	90.6	14.0	103.1	0.5	4.9	37.5
Briggs	29	56.5	60.8	26.2	85.1	14.9	101.6	2.2	2.5	36.5
Knudson	31	62.1	60.7	29.9	80.6	14.2	118.0	2.5	1.4	37.1
Overall - 14 locations										
2375	14	58.3	60.7	30.2	88.3	14.3	105.6	1.8	4.0	42.1
Alsen	14	53.0	61.8	29.9	88.3	15.0	114.5	0.8	3.1	37.6
Bigg Red	14	55.5	62.5	31.4	93.7	13.8	102.3	0.3	4.1	37.5
Briggs	14	51.4	60.8	27.9	87.7	14.5	103.6	1.7	2.1	36.5
Knudson	14	59.1	60.6	31.4	82.3	14.0	118.1	2.3	1.5	37.1
Bigg Red vs. 2375										
Bigg Red	15	53.7	62.3	31.4	93.7	13.8	102.7	0.3	4.1	37.5
2375	15	56.2	60.5	30.2	88.3	14.3	106.7	1.8	4.0	42.1
Bigg Red vs. Alsen										
Bigg Red	38	56.9	62.3	29.7	90.6	14.0	103.1	0.5	4.9	37.5
Alsen	38	53.3	61.7	28.1	85.7	15.3	117.0	1.2	3.5	37.6
Bigg Red vs. Briggs										
Bigg Red	29	60.9	62.7	29.8	91.5	14.0	102.9	0.4	4.9	37.5
Briggs	29	56.5	60.9	26.2	85.1	14.9	104.7	2.2	2.5	36.5
Bigg Red vs. Knudson										
Bigg Red	31	58.6	62.5	30.2	90.6	14.0	102.4	0.4	4.7	37.5
Knudson	31	61.8	60.7	29.9	80.6	14.2	117.9	2.5	1.4	37.1

[1] Heading Date = Days after June 1.
[2] Sed= Flour SDS sedimentation value, a measure of gluten strength.
[3] VSK = visually scabby kernels.
[4] Leaf Rust = scale of 1 (resistant) to 7 (very susceptible).
[5] Kernel Weight = gram weight of 1000 seed.

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#200700114

Table 19. Performance of Selected Cultivars and Bigg Red in 2005 NDAES HRSW Trials.

Variety	Yield -bu/a-	Test Weight -lb/bu-	Heading Date[1]	Height -cm-	Protein -%-	VSK[2] -%-	Leaf Spot[3] %	1000 Kernel Weight -g-
Carrington - dryland								
Alsen	46.0	58.8	66.0	90.4	16.0	2.5	-	24
Bigg Red	54.5	61.9	67.8	95.8	14.4	2.4	-	25.9
Briggs	52.2	58.8	64.5	85.3	15.7	9.2	-	26.2
Knudson	51.5	57.6	68.3	95.0	14.4	5.3	-	24.7
Carrington - irrigated								
Alsen	56.0	61.8	62.5	81.8	15.8	-	-	30.7
Bigg Red	72.8	64.1	66.0	89.9	14.3	-	-	33.7
Briggs	68.3	60.8	59.5	81.5	15.1	-	-	32.7
Knudson	68.6	60.7	64.3	79.2	14.1	-	-	31.6
Hettinger								
Alsen	39.4	57.8	78	76.2	-	-	-	-
Bigg Red	39.9	60.0	78	76.2	-	-	-	-
Briggs	45.0	57.0	76	73.7	-	-	-	-
Knudson	36.6	57.3	80	71.1	-	-	-	-
Langdon								
Alsen	55.7	60.2	54	86.4	15.5	0.8	-	-
Bigg Red	51.9	61.6	55	96.5	13.3	0.5	-	-
Briggs	56.0	59.3	53	88.9	15.5	2.5	-	-
Knudson	65.2	59.0	56	88.9	14.2	1.3	-	-
Minot								
2375	61.4	60.1	60	76.2	14.2	-	-	32.8
Alsen	62.2	61.4	60	71.1	15.8	-	-	31
Bigg Red	61.5	62.3	60	81.3	13.9	-	-	30
Briggs	73.3	61	60	78.7	16.5	-	-	33.3
Knudson	82.6	61.3	61	71.1	14.9	-	-	34.3
Ransom County								
Alsen	39.1	58.0	-	-	-	10.3	17.8	-
Bigg Red	39.6	60.9	-	-	-	1.4	25	-
Briggs	39.7	55.9	-	-	-	22.8	10.2	-
Knudson	44.2	55.4	-	-	-	12.3	5.6	-
Williston								
2375	51.3	60.9	58	73.7	16.3	-	-	30.1
Alsen	52.2	61.1	58	71.1	17.1	-	-	28.6
Bigg Red	55.9	62.8	59	78.7	16.1	-	-	26.7
Briggs	58.2	61.0	58	76.2	17.3	-	-	29.8
Knudson	50.5	60.8	59	73.7	16.9	-	-	31.3

[1] Heading Date = Days after planting.
[2] VSK = visually scabby kernels.
[3] Leaf spot = tan spot and *Septoria tritici*.

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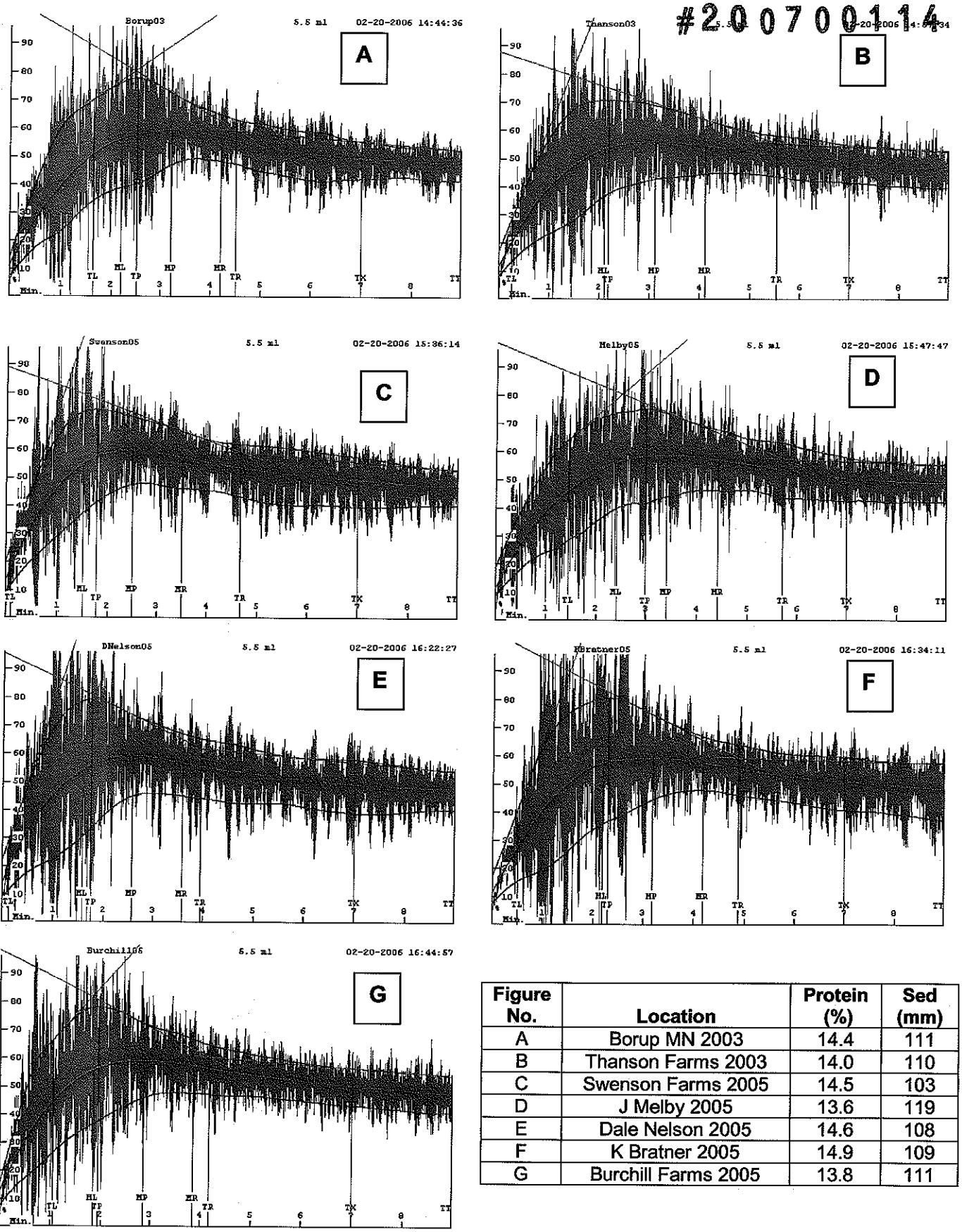

Figure No.	Location	Protein (%)	Sed (mm)
A	Borup MN 2003	14.4	111
B	Thanson Farms 2003	14.0	110
C	Swenson Farms 2005	14.5	103
D	J Melby 2005	13.6	119
E	Dale Nelson 2005	14.6	108
F	K Bratner 2005	14.9	109
G	Burchill Farms 2005	13.8	111

Figure 1. Mixograph profiles for Bigg Red grown at seven locations in 2003 and 2005 along with associated protein content and SDS sedimentation value.

REPRODUCE LOCALLY. Include form number and edition date on all reproductions. FORM APPROVED - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued *(7 U.S.C. 2421)*. The information is held confidential until the certificate is issued *(7 U.S.C. 2426)*.

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
WestBred, LLC	FA-900-720	Bigg Red
4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*	**5. TELEPHONE** *(Include area code)*	**6. FAX** *(Include area code)*
81 Timberline Dr. Bozeman, MT 59718-8184	(406) 587-1218	(406) 586-8247
	7. PVPO NUMBER	#200700114

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. **If no, please explain.** ☑ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? **If no, give name of country.** ☑ YES ☐ NO

10. Is the applicant the original owner? ☑ YES ☐ NO **If no, please answer one of the following:**

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?
☐ YES ☐ NO **If no, give name of country**

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?
☐ YES ☐ NO **If no, give name of country**

11. Additional explanation on ownership *(Trace ownership from original breeder to current owner. Use the reverse for extra space if needed)*:

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

Form Approved OMB NO 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT F
DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S)	ADDRESS *(Street and No. or RD No., City, State, and Zip Code and Country)*	TEMPORARY OR EXPERIMENTAL DESIGNATION
WestBred, LLC	81 Timberline Dr. Bozeman, MT 59718	FA-900-720
		VARIETY NAME Bigg Red
NAME OF OWNER REPRESENTATIVE (S)	ADDRESS *(Street and No. or RD No., City, State, and Zip Code and Country)*	FOR OFFICIAL USE ONLY
Dr. Greg Fox	81 Timberline Dr. Bozeman, MT 59718	PVPO NUMBER #200700114

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.

Signature

October 31, 2006
Date

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